

MAGNETIC LEVITATION STAGE APPARATUS AND METHOD

ABSTRACT OF THE INVENTION

5 A magnetic levitation (maglev) stage apparatus and method is disclosed. The maglev stage includes a movable platen having an upper surface capable of supporting a workpiece. A set of magnet arrays is arranged on the bottom surface of the platen, and first and second side magnet arrays are arranged on opposite sides of the platen.

10 A support frame at least partially surrounds the platen on the first and second sides and the bottom surface. A plurality of motor coils is arranged on the support frame so as to be in operable communication with the set of magnet arrays and the side magnet arrays. The magnet arrays and motor coils are operable to magnetically levitate the platen within the support frame and move the platen in up to six degrees of freedom (DOF), with all forces directed through the center-of-gravity of the platen along the DOF axes. Movable counterweights may also be employed to facilitate the smooth movement of the platen.